AMBIENT-IT

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Sign up

Puppet training

3 days (21 hours)

Presentation

Puppet is an open-source software package that enables you to efficiently manage, install, configure or update a large number of machines, while adapting to the specific features of each . Once configured, maintenance is quick and easy, and can be easily restored. Puppet comes with a host of code management and testing tools, such as Hiera & r10k, to simplify the use of its many features. These tools also improve the clarity & readability of your infrastructure, keeping the architecture consistent and facilitating the deployment of newly created configurations without losing organization.

Puppet has two layers, one being a configuration language describing hosts and services, the other enabling the administrator to implement the configuration on various platforms such as Windows / Linux / OSX. The administrator can define a service configuration that Puppet will monitor and execute.

In this training course, you'll discover how to make your infrastructure scalable. We'll look at how to deploy your configurations on all your machines, mastering all subtleties and different features of Puppet and Puppet Enterprise and their respective tools.

Like all our training courses, this one will introduce you to the latest stable release (Puppet 8.10 at the time of writing).

Objectives

- Reduce the complexity of managing your infrastructure
- Use Hiera and r10k to separate code from data
- Mastering scalable architecture with Puppet
- How to automate infrastructure tasks with Puppet
- Use Puppet tools & ecosystem

Target audience

- Developers, Architects, System Administrators / Sysadmin

Prerequisites

- Basic knowledge of a Unix/Linux system, basic scripting/shell skills
- Good knowledge of Windows system administration
- Learn the basics of object-oriented programming
- Previous experience with deployment tools
- Test My Knowledge

Our Puppet Enterprise version 8 training program: DevOps Scalable Infrastructure

Day 1 - Puppet basics

- Puppet prerequisites - knowledge, skills, tools, ...
- Packaging - building, integrating and deploying packages and repositories
- IAC (Infrastructure As Code) concepts - Code (puppet modules), Configurations (hieradata), Query and workflow management
- Puppet products and services - Overview
- Puppet perimeter - KISS (Keep It Stupid and Simple) versus engineering concepts
- User interfaces - Puppet Console, APIs, CLI

Day 2 - Keeping your servers up to date

- Hieradata - organize your infrastructure's data hierarchy (centralize, inherit, secure configurations as much as you can, then replace only when necessary).
- Puppet Compilation - Understanding the Puppet agent runtime lifecycle
- Puppet Développement - Create your own modules
- Puppet idempotency concept - Apply the catalog as many times as you like

Day 3 - Deploy, update and migrate distributed applications on the infrastructure

- Puppet development - facts, functions and custom types to enhance your developed modules
- Puppet Forge - Don't reinvent the wheel!
- Puppet Development - Defining an application stack with Puppet
- Puppet Discovery - Real-time knowledge of infrastructure status (soon obsolete)
- Understanding concepts: declarative and imperative
- Infrastructure - Configure your lab environment (puppet enterprise, gitlab, rpmbuild, rpm repository)

Days 4 & 5 - Additional module on request (+2 days)

Dependending on what is possible to play with (is there a laboratory? a git server? a repository? etc), this part is dedicated to practice and will be adjusted onsite regarding participant skills and needs.

Full Stack Deployment

- OS (Linux / Unix / Windows), Network equipments - Quick wins are better than long fails
- System administration - DNS, NTP, Users, Roles, SSH keys, Kernel parameters, Filesystems, etc.
- Middleware administration - Databases (servers/clients), Web servers
- Software administration - Challenge your R&D team to get the best quality only (or let them do the hard work in production)
- Patch management - Puppet remediate

Reporting

- Vulnerability scan (based on task and remediate)
- Change notification - mailing, HMI

Server provisioning

- Baremetal install - Razor overview
- VM install - VMWARE ESX, VRA,VRO

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Puppet language

- Coding style
- Create modules
- Create a Manifest
- Classes
- Class parameters
- Types
- Providers
- Templates

Roles and Profiles

- Profiles: best practices
- Use the include keyword
- Using subdirectories for groups
- Hiding complexity: parameters, defaults and abstraction
- Decide how to define your parameters for component classes
- Automatic class parameter search & search function

- Roles: best practices
- Include & role naming
- Decide on the granularity of roles for your nodes

Resources

- Types
  - k5login
  - nagios*
  - schedule
  - interface
  - package
  - router
  - host
  - exec
  - interface ...
- virtual and exported resources
- Tags
- Load balancing
- Database connection

Hiera 5

- Organizing files
- Key management with Yalm
- Using the Lookup function
- Debug
- Introducing Jerakia

Environments

- Introducing r10k
- Creating development environments
- Environment deployment with r10k

Code Manager

- Organizing your code
- Using RBAC
- Repository management

Workflow

- Workflow creation
- Repositories

- Tasks
- Using PDK

Continuous integration

- Puppet Pipelines
- Plugin management
- Discover Jenkins
- PDK integration
- Creating unit tests with Puppet RSpec

Tasks and Discovery

- Bolt installation
- Discovery installation
- Source management
- Agent installation
- Service management

Orchestration

- Creating an application
- Database management
- Deploying an application

Puppet Enterprise

- Adding nodes on PE
- Dynamic node classification with groups
- Orchestrate application stacks

Error detection and resolution: Troubleshooting & Profiling

- Waiting for certificate signature
- Certificate reuse
- Connection settings
- Syntax errors
- Missing resources
- Dependencies
- Authentication

Advanced modules: 2 additional days

Extending Puppet: Extending Puppet (optional module)

- Custom facts & Debugging facts
- Custom functions
- Types & providers
- Creating and distributing the type
- Namevar : special attribute
- Properties, optional, parameters, defaults
- Input Values: Verification, Validate block, munge datatype
- Exists, create and destroy methods
- GET & SET methods: Managing type properties
- Implementing the self.instances method

Advanced tuning: Scaling (optional module)

- Load balancing
- Estimated number of agents to support
- Certification authorities
- Tuning PuppetServer
  - Puppet Enterprise / Open Source implementation
- Tuning Puppet DB
  - CPU thread management
  - Heap size management
- PuppetDB with PGTune
- Automatic settings

Companies concerned

This course is aimed at both individuals and companies, large or small, wishing to train their teams in a new advanced computer technology, or to acquire specific business knowledge or modern methods.

Positioning on entry to training

Positioning at the start of training complies with Qualiopi quality criteria. As soon as registration is finalized, the learner receives a self-assessment questionnaire which enables us to assess his or her estimated level of proficiency in different types of technology, as well as his or her expectations and personal objectives for the training to come, within the limits imposed by the selected format. This questionnaire also enables us to anticipate any connection or security difficulties within the company (intra-company or virtual classroom) which could be problematic for the follow-up and smooth running of the training session.

Teaching methods

Practical course: 60% Practical, 40% Theory. Training material distributed in digital format to all participants.

Organization

The course alternates theoretical input from the trainer, supported by examples, brainstorming sessions and group work.

Validation

At the end of the session, a multiple-choice questionnaire verifies the correct acquisition of skills.

Sanction

A certificate will be issued to each trainee who completes the course.